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Leaflet No. 296
UNITED STATES DEPARTMENT OF AGRICULTURE

The Redheaded Pine Sawfly[1]

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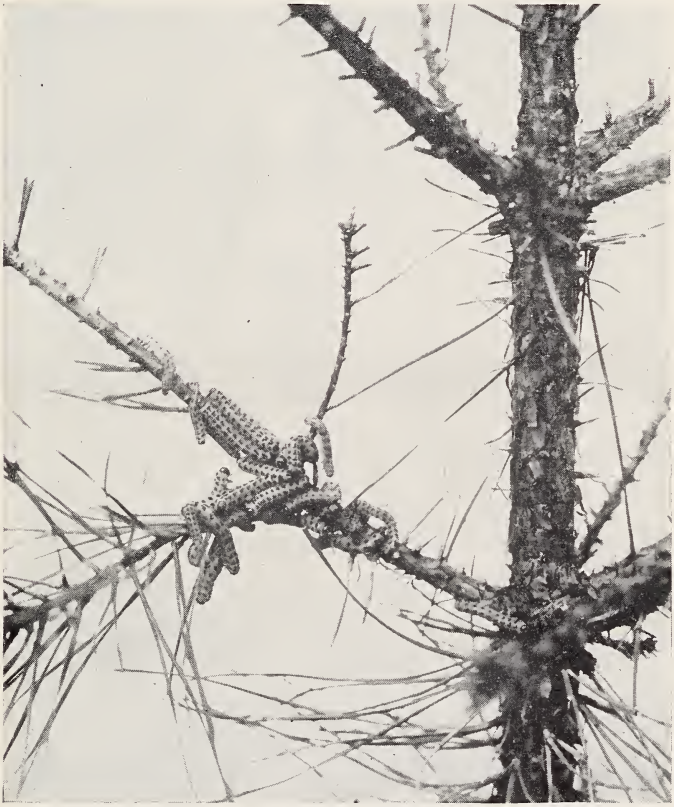

Larvae of the red-headed pine sawfly on a pine branch.
Courtesy of Duke University School of Forestry.

The red-headed pine sawfly [2] is the most widespread and destructive of our native sawflies that attack pines. It may be found throughout the eastern part of North America from Ontario and Quebec south to the Gulf of Mexico. The larvae feed on the needles of many kinds

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[1] This leaflet is a revision of and supersedes Farmers' Bulletin 1259, A Sawfly Injurious to Young Pines.

[2] *Neodiprion lecontei* (Fitch).

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of pines, and occasionally on other conifers. They prefer young trees, and therefore are most destructive in forest plantations, nurseries, and ornamental plantings. In recent years severe outbreaks have occurred in plantations in Alabama, Illinois, Michigan, Minnesota, Mississippi, New York, and Wisconsin. In some places the foliage over large acreages has been completely stripped.

This sawfly prefers the pines having needles in clusters of two or three. Its hosts include jack, slash, lodgepole, Japanese red, shortleaf, mugho, Austrian, longleaf, ponderosa, red, pitch, Scotch, loblolly, and Virginia pines. It has also been found on eastern and western white pines, tamarack, and deodar cedar, but it probably attacks these trees only when they are growing near preferred hosts that have been defoliated.

Description

The adults of the red-headed pine sawfly are rather robust-looking four-winged insects, about ¼ to ⅜ inch long. The male is black with reddish-yellow legs and has two feathery antennae. The female is larger than the male. The head and first two thoracic segments are reddish brown and the remainder of the body for the most part is blackish. The female antennae are slender and not feathery.

This insect is called a sawfly because the ovipositor, or egg-laying organ, of the female has blades and teeth. It is used to saw through the needle tissue in making pockets in which to lay its eggs. From 5 to 10 or more eggs may be deposited in each of several adjacent needles. The yellowish egg scars, or pockets, are readily seen against the dark green of the needles.

The newly hatched larvae are whitish and unspotted, with brownish heads. Later, after they have shed their skins several times, they become yellowish white with six rows of conspicuous black spots on the body and the head reddish. They are ⅞ to 1 inch long when fully grown.

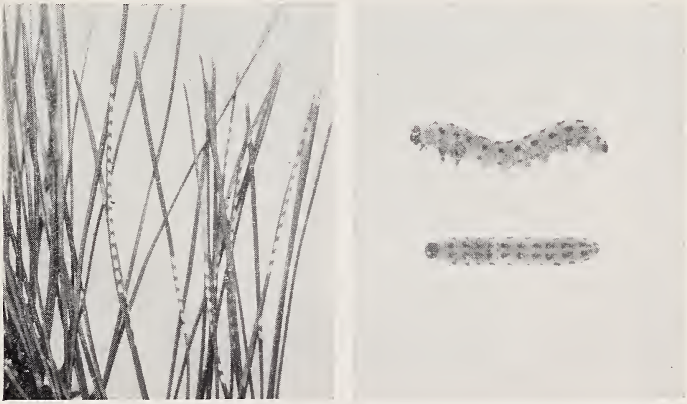
The larvae feed in groups and usually strip one branch of needles before moving to another. They prefer old needles, but late in the summer may eat new needles and even the tender bark of young twigs. Defoliated branches or trees usually die.

The larvae become full grown in 25 to 31 days. They drop to the ground and spin tough, reddish-brown capsule-shaped cocoons, 5⁄16 to 7⁄16 inch long, in the topsoil, where they transform to adults.

Over most of its range this sawfly may go through one generation and a partial second or two complete generations each year. In some of the Southern States there may be a partial third generation. Larvae maturing by the third week in July may transform to adults in August or September. Some of these larvae as well as those maturing later remain in their cocoons through the winter, and emerge as adults the following spring or early summer; some even remain dormant over two winters. Broods of larvae may thus be found feeding from spring until late in the fall, the period depending somewhat on the climate.

Natural Control

Although outbreaks of the red-headed pine sawfly appear occasionally, they generally subside after a few years. Among its natural enemies are 10 or more species of insect parasites and numerous predators, including insects, birds, and mammals. However, disease and the weather are the most important natural control factors. Diseases often take a heavy toll of the larvae during periods of abundance. Extreme heat during the summer and cold and early snowstorms late in the fall kill many larvae.



Left—Needles of red pine showing eggs of the red-headed pine sawfly embedded in them. Right—Full-grown larvae of the red-headed pine sawfly. *Courtesy of Quebec Bureau of Entomology.*

Control Measures

The most efficient and economical method to use in controlling the red-headed pine sawfly will depend on the accessibility and the extent and severity of the infestation. If only a few groups of larvae are found on ornamental plantings, hand picking is the best method. When the larvae are generally distributed on ornamentals or small plantations, or in nursery rows, an insecticide may be applied with a knapsack or hydraulic sprayer, or with a small mist blower. On large areas, such as forest plantations, it would be more practical to distribute an insecticide from an airplane or helicopter or a large mist blower mounted on a truck.

Both lead arsenate and DDT are effective against the larvae. DDT is on the market in several forms, but an emulsifiable concentrate is recommended for use against this insect, because it is not likely to clog the nozzles or burn the foliage, and it has a longer residual effect.

CAUTION.—DDT and lead arsenate are poisonous. Store them in plainly labeled containers away from all food products.

Remarkable success has been obtained with aerial applications of DDT. For pure stands of pine 1 gallon of spray per acre will give adequate coverage, but on areas with a deciduous overstory 2 gallons should be used.

If lead arsenate is to be used, the acid form should be applied in suspension as a spray or mist. A drying oil should be added as an adhesive to lengthen the period of effectiveness of the insecticide. Fish and linseed oils are most commonly used for this purpose, but tung, soybean, corn, and cottonseed oils are satisfactory. For application by mist blower some mineral oil should be included to prevent complete evaporation of the finely atomized mist before it reaches the foliage.

The timing of the application is important because of the long period over which egg laying may occur. If the spraying is delayed until the larvae that hatched first are about half grown, the deposit will be effective also against those hatching later.

The quantity of spray that will give adequate coverage depends on the type of sprayer. The accompanying chart may be used as a guide.

Quantities of insecticides recommended for use with various types of equipment

Insecticide and equipment	Concentrate or powder	Adhesive (drying oil)	Water	Quantity of spray per acre
DDT (25-percent emulsifiable concentrate):				*Gallons*
Knapsack sprayer	1 pint		7 pints	20 to 25.
Hydraulic sprayer	2 quarts		99½ gallons	300 to 400.
Mist blower	1 quart		3 quarts	2 to 4.
Aircraft	2 quarts		2 quarts	1 to 2.
Acid lead arsenate (powder):				
Knapsack sprayer	9 tablespoonfuls.	1 tablespoonful.	1 gallon	50 to 75.
Hydraulic sprayer	4 pounds	1 pint	100 gallons	300 to 400.
Mist blower	1½ pounds	4½ ounces plus mineral oil 1½ ounces.	Water to make 1 gallon.	4 to 6.

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